



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar	Registration		SKM 9956
	Registernummer		
	Num. d'enregistremen		
		Date / Datum / Date	20/6/2013

Company / Firma / Société	HELIOAKMI S.A.	Country/Land/Pays	Greece
Street / Straße / Rue	Thesi Nea Zoi - Aspropyrgos, Attiki	Website	www.helioakmi.com
Postal Code, Place / PLZ, Ort / Code postal, Place	193 00 Aspropyrgos, Attiki	E-mail	megasun@helioakmi.com
		Tel. / Fax	+030 210 5595625 / 210 55957

System classification / G / F	
Flow principle / G / F	Thermosyphon / G / F
Direct / indirect / G / F	Direct / G / F
Press. principle / G / F	Closed / G / F
Drain back/down / G / F	No drain (always filled) / G / F
Storage location / G / F	Outdoor / G / F
Storage position / G / F	Horizontal / G / F
Int. back-up / G / F	None / G / F
If other: / G / F	English / Deutsch / Francais
EN12976 type / G / F	Solar only / G / F

Collector(s) / Kollektor(en) / Capteur(s)		Storage(s) / Akkumulator(en) / F	
Company / Hersteller / Manufactuer	HELIOAKMI S.A.	Company / Hersteller / Manufactuer	HELIOAKMI S.A.
Keymark reg. no. (optional)	SKM 9926/3		

Model Bezeichnung Modèle	Per module / G / F				No. modules G L	Model Bezeichnung Modèle	Total volume G L litres	Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors Tout mm	Gross length Länge (Außenmaß) longueur hors tout mm	Back-up heated volume G L litres	EI. back-up power G L kW	
	Aperture area (Aa) Aperturfläche (Aa) Superficie d'entrée (Aa) m ²	Gross length Länge (Außenmaß) Longueur Hors tout m	Gross width Breite (Außenmaß) Largeur hors Tout m									
				min - max								
MEGASUN ST-ALSEL 2000	1,8	2,05	1,01	1	-	1	SP-KK 160	155	530	1300	-	-
MEGASUN ST-ALSEL 2500	2,33	2,05	1,28	1	-	1	SP-KK 200	187	570	1300	-	-
							SP-KK 300	290	570	2050	-	-

Controller / G / F		Fluid / G / F	
Company/Hersteller/Manufacteur	xxxxxxxxxxxxxxx	Company/Hersteller/Manufacteur	xxxxxxxxxxxxxxx
Model / Bezeichnung / Modèle	xxxxxxxxxxxxxxx	Model / Bezeichnung / Modèle	Propylene glycol solution
Functions	English Deutsch Francais	Freezing point	-5 to -36 °C

System family overview / G / F						
Collector G F	No. collectors / G / F					
	Storage / G / F					
	SP-KK 160	SP-KK 200	SP-KK 300			0
MEGASUN ST-ALSEL 2000	1			2		
MEGASUN ST-ALSEL 2500		1				
0						

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "Demokritos" - SOLAR & ENERGY SYSTEMS LA
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtsnummer / F	6052F1, 6050DE1, 6052DE1
Date of test report / Datum G / date F	30/7/2012

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
English Deutsch Francais	amp & signature of test lab



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System family overview / G / F												
Collector type G F	Number of collectors / G / F											
	Storage type / G / F											
	SP-KK 160			SP-KK 200			SP-KK 300					
MEGASUN ST-ALSEL 2000	1						2					
MEGASUN ST-ALSEL 2500			1									

Name of system konfiguration / G / F												CHALMERS 160
Collector type G F	MEGASUN ST-ALSEL 2000	No. collectors G F	1	Storage type G F	SP-KK 160							

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	140 l/d	170 l/d	200 l/d	140 l/d	170 l/d	200 l/d	140 l/d	170 l/d	200 l/d	140 l/d	170 l/d	200 l/d
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	2.172	2.637	3.101	874	929	955	40,3	35,2	30,9			
Würzburg, DE	2.085	2.532	2.970	920	990	1.025	44,2	39,1	34,4			
Davos, CH	2.356	2.856	3.364	1.261	1.332	1.367	53,7	46,6	40,6			
Athens, GR	1.621	1.962	2.313	1.174	1.314	1.410	72,8	66,8	61,0			

Perf. indicators G F	Q _d	Heat demand / G / F										
	Q _L	System output / G / F										
	f _{sol}	QL/Q _d ; solar fraction / G / F										
	Q _{par}	Elec. for pumps/controllers / G / F										

Ref. conditions G F		Stockholm	Würzburg DE	Davos CH	Athens GR		
	G	1.156	1.226	1.682	1.717		
	T _a	7,5	9,0	3,2	18,5		
	T _c	8,5	10,0	5,4	17,8		
	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2		

G	kWh/m ²	Annual irradiation South, 45° / G / F				
T _a	°C	Annual mean air temp. / G / F				
T _c	°C	Annual mean cold water temp. / G / F				
ΔT _c	°C	Seasonal variation of T _c / G / F				
T _h	45°C	Desired (mix. valve) temp. / G / F				

Max. operating press. - collector side G F	300	kPa	Max. operating press. - tank side G F	700	kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "Demokritos" - SOLAR & ENERGY SYSTEMS L
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	6052F1, 6050DE1, 6052DE1
Date of test report / G / F	30/7/2012
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
English	
Deutsch	
Français	



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System family overview / G / F						
Collector type G F	Number of collectors / G / F					
	Storage type / G / F					
	SP-KK 160	SP-KK 200	SP-KK 300			
MEGASUN ST-ALSEL 2000	1		2			
MEGASUN ST-ALSEL 2500		1				

Name of system configuration / G / F					CHALMERS 200
Collector type G F	MEGASUN ST-ALSEL 2500	No. collectors G F	1	Storage type G F	SP-KK 200

Location G F	Daily draw-off litres/day / G / F /									
	170 l/d	200 l/d	250 l/d	170 l/d	200 l/d	250 l/d	170 l/d	200 l/d	250 l/d	
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y
Stockholm, SE	2.637	3.101	3.872	1.113	1.174	1.218	42,2	37,9	31,4	
Würzburg, DE	2.532	2.970	3.714	1.174	1.244	1.296	46,4	41,9	34,9	
Davos, CH	2.856	3.364	4.205	1.621	1.691	1.734	56,7	50,3	41,3	
Athens, GR	1.962	2.313	2.891	1.472	1.612	1.778	75,0	69,7	61,5	

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Q_d; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions G G F		Stockholm SE	Würzburg DE	Davos CH	Athens GR			
	G	1.156	1.226	1.682	1.717			
	G	T _a	7,5	9,0	3,2	18,5		
	F	T _c	8,5	10,0	5,4	17,8		
	F	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2		
G	kWh/m ²	Annual irradiation South, 45° / G / F						
T _a	°C	Annual mean air temp. / G / F						
T _c	°C	Annual mean cold water temp. / G / F						
ΔT _c	°C	Seasonal variation of T_c / G / F						
Th	45°C	Desired (mix. valve) temp. / G / F						

Max. operating press. - collector side			Max. operating press. - tank side		
G	300	kPa	G	700	kPa
F			F		

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "Demokritos" - SOLAR & ENERGY SYSTEMS LA
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Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
English Deutsch Français	



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System family overview / G / F						
Collector type	Number of collectors / G / F					
	Storage type / G / F					
	SP-KK 160	SP-KK 200	SP-KK 300			
G						
F						
MEGASUN ST-ALSEL 2000	1		2			
MEGASUN ST-ALSEL 2500		1				

Name of system konfiguration / G / F Collector type G F						CHALMERS 300 No. collectors G F						Storage type G F					
						2						SP-KK 300					

Calculated annual results / G / F												
Location	Daily draw-off litres/day / G / F											
	250	300	400	250	300	400	250	300	400	250	300	400
G	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
F												
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	3.872	4.652	6.202	1.708	1.822	1.953	44,1	39,2	31,5			
Würzburg, DE	3.714	4.459	5.948	1.778	1.936	2.059	47,9	43,4	34,6			
Davos, CH	4.205	5.046	6.728	2.497	2.654	2.777	59,4	52,6	41,3			
Athens, GR	2.891	3.469	4.625	2.225	2.488	2.829	77,0	71,7	61,2			

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	Q _L /Q _d ; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions		Stockholm	Würzburg DE	Davos CH	Athens GR	
	G	1.156	1.226	1.682	1.717	
G	T _a	7,5	9,0	3,2	18,5	
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G	kWh/m ²	Annual irradiation South, 45° / G / F				
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T _h	45°C	Desired (mix. valve) temp. / G / F				

Max. operating press. - collector side G F	300	kPa	Max. operating press. - tank side G F	700	kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtnummer / F Date of test report / G / F Test method / G / F	NCSR "Demokritos" - SOLAR & ENERGY SYSTEMS L www.solar.demokritos.gr 6052F1, 6050DE1, 6052DE1 30/7/2012 ISO 9459-5 (DST)
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